Table of Contents

Page

8.0 STORAGE YARDS

8.1 INTRODUCTION

This section contains design criteria and procedures for site selection, sizing, layout and reconnaissance of storage yards to be used as temporary storage areas for the gas pipeline related construction materials.

Criteria for river crossing staging areas and double-jointing pipe yards are not included in this section.

There are no specifications or calculations included in this section. Additionally, design criteria for embankment thickness are presented in Section 9, and criteria for access roads, drainage and erosion control, restoration, and clearing are found in other sections of this Technical Information Supplement.

8.2 CODES AND CRITERIA

8.2.1 Codes

- Alaska Department of Transportation and Public Facilities, Title 17, Chapter 10, Engineering Encroachments, Driveways and Road Approaches
- Alaska Department of Transportation and Public Facilities, Standard Specifications for Highway Construction
- American Association of State Highway and Transportation officials, Standards for Materials and Construction Methods
- Alaska Statutes, Title 16 – Fish and Game
- Alaska Statutes, Title 38 – Public Land
- Alaska Administrative Code, Title 18 – Environmental Conservation
- Code of Federal Regulations, Title 18 – Conservation of Power and Water Resources
- Code of Federal Regulations, Title 23 – Highways
- Code of Federal Regulations, Title 33 – Navigation and Navigable Water
- Code of Federal Regulations, Title 43 – Public Lands: Interior
- Code of Federal Regulations, Title 50 – Wildlife and Fisheries
- Federal Water Pollution Control Act, which led to enactment of the Clean Water Act, Title 4 – Permits and Licenses, Section 402, National Pollutant Discharge Elimination System.
- Federal Right-of-Way (ROW) Grant for the Alaska Natural Gas Transportation System Alaska Segment, Serial No. F-24538 (December 1, 1980), as such may be updated and/or amended from time to time.

- Federal Energy Regulatory Commission conditional certificate of public convenience and necessity, issued on December 16, 1977, as such is finalized

8.2.2 Criteria

8.2.2.1 Location and Spacing

- Storage yards will be located in close proximity to the pipeline ROW and will be easily accessible from the public highway system.
- Where staging areas for river and stream crossings are used for temporary storage, such use shall be in accordance with Section 16 and the construction plan.
- Where practical storage yards will be sited adjacent to solid waste disposal sites.
- Physical barriers, such as mountain passes, major river crossings, excessive grades, and rugged terrain will be considered so as to space sites to maximize haul efficiency and site utilization.
- Storage yards will be located so that the yard, its access roads and its accompanying traffic and associated activities will have a minimum impact on TAPS or other adjacent facilities.
- The number of yards will be held to the minimum consistent with each section needs for efficient operation.
- Use of adjacent public and private lands will be considered during the siting of yards. Sites will not be located where storage yard activities will adversely impact public health and safety or the use of public recreation facilities.
- Preference for use will be given to existing disturbed areas, such as unused or abandoned TAPS storage yards and depleted mineral material sites, where consistent with project needs and other constraints herein.
- To the extent practical, new sites will not be located in areas visible from public highway systems or areas used for residence or recreation.
- Special material storage requirements for items such as boardstock insulation, river weights, etc. will be considered in siting storage yards.
- Material delivery and construction schedules will be considered in siting storage yards.
- Where practical, storage yards will be sited on thaw-stable foundation soils.
- Storage yards will not be located in unique or sensitive wildlife habitats.
- Storage yards will not be located in areas of unique or sensitive vegetation.
- Storage yards will not be sited in Category A wetlands. Storage yards will be sited in Category B wetlands only if excessive haul distances make it mandatory.

- Storage yards will not be located within 500 feet of the active floodplain unless otherwise approved.

8.2.2.2 Sizing

- Sizing of each storage yard will be a function of the quantity and type of materials to be stored.
- Sizing will provide for loading/unloading areas and adequate traffic routes.
- Sizing criteria for storage yard design is presented in Table and Figure.

8.2.2.3 Embankment Thickness

- The storage yard pad will be graded as required making maximum use of on-site material with balanced cuts and fills. Imported gravel fill overlays, if required, will be designed for site specific geotechnical, thermal and drainage conditions; expected loading conditions; and life of the facility.
- Pad cross slopes and fill slopes will be as presented in Table .

8.2.2.4 Drainage, Erosion Control and Restoration

- Site-specific design for drainage and erosion control will be in accordance with criteria presented in Section 11.
- When storage yard sites are no longer required, restoration will be performed in accordance with criteria presented in Section 12.
- Site design will provide for adequate protection of stored materials from the site-specific flood conditions.
- If petroleum products or toxic chemicals are to be stored, containment and protection shall be in accordance with the Environmental Information Supplement section: “Oil and Hazardous Substances Management.”

8.2.2.5 Clearing

- Clearing and disposal of cleared materials will be in accordance with criteria presented in Section 10.

8.2.2.6 Site Access

- Access to storage yards will be designed in accordance with criteria and procedures presented in Section 7.
- Access roads to storage yards may be temporary, all season roads.

8.3 DESIGN PROCEDURES

8.3.1 General

Storage yards will provide for an adequate and environmentally safe method of storing pipeline related construction materials. Staging areas for river crossings and double-jointing pipe yards are not considered a part of storage yards.

The storage yard program will be accomplished in three distinct phases:

- Preliminary site selection
- Field reconnaissance and surveys
- Final site-specific design

Each phase of the planned program will be completed by a multidisciplinary team consisting of engineers, construction, and environmental specialists. The design packages will be developed to accommodate both permitting and construction bid package requirements.

8.3.2 Preliminary Site Selection

The preliminary storage yard selection will be made in the office utilizing location, spacing, and sizing criteria. Project documents, such as alignment sheet photo mosaics, topographic mapping, color aerial photography, route soils maps, Environmental Master Guide and other sources of information will be used in the selection of the storage yards.

8.3.3 Field Reconnaissance and Surveys

Upon completion of the preliminary site selection, a field reconnaissance of each selected site will be performed based on a detailed checklist to gather site-specific information.

Field reconnaissance will gather site-specific data regarding but not limited to, the following:

- Terrain
- Site drainage
- Subsurface conditions
- Site access routes
- TAPS facilities
- Current land use
- Vegetation
- Visual impacts
- Fish and wildlife use and habitat
- Highways

This information will be used to determine whether further site-specific topographic surveys and subsurface investigations will be required, whether the site will be deleted or design can proceed.

8.3.4 Final Site-Specific Design

Final design will be based on criteria presented in this section utilizing information gathered during field reconnaissance and other site-specific investigations. Final design will provide the documentation necessary for obtaining agency permits as well as design drawings for inclusion into the construction bid package. Generally, the final design documents will show site specific layout, location of existing facilities, proposed drainage facilities, embankment cross sections, and other design details pertinent to the storage yard design.

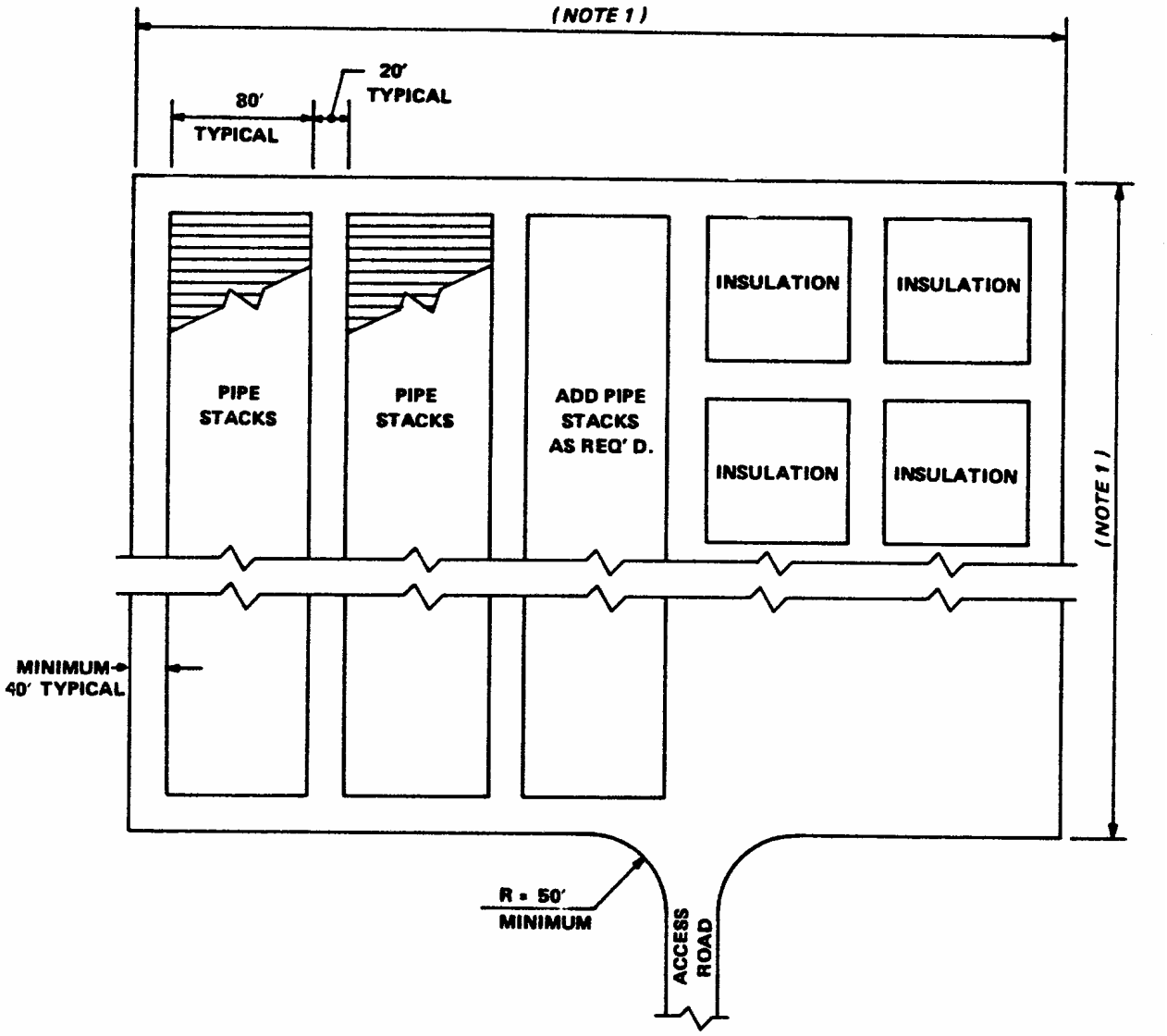

Figure 8-1 Typical Storage Yard Layout

Notes: 1) Area based on storage requirements (site specific) plus minimum 15% contingency.
2) Access road design in accordance with Section 7.

Table 8-1 Storage Yards

Site Layout Sizing Standards		
Storage Area Requirement	Area required will be based on space needed to store the estimated quantity of materials. Minimum site area will be equal space occupied by pipe, boardstock insulation and other materials to be stored and required clearances plus a minimum 15% increase for contingencies and vehicle maneuvering.	
Working Area Clearances	Minimum 40' access strip around perimeter of stored materials.	
	20' clearance between rows of stacked material.	
Maximum Stacking Height		
Pipe	Bare/coated pipe – Maximum 3 tiers high	
	Insulated pipe – 2 tiers high	
	Concrete coated pipe – 2 tiers high	
	Concrete coated, insulated pipe – 1 tier high	
Board Stock Insulation	18 feet high	
Site Preparation and Grades		
Granular Embankment Thickness	See Section 9	
Embankment Fill Slopes	2:1 Maximum	
Finish Grade Pad Cross Slope	Preferred	0% (Slope to drain)
	Maximum	1.5%